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- A water-based coating composition, comprising:
a supporting polymer comprising a plurality of functional moieties capable of undergoing crosslinking reactions, said supporting polymer soluble in or emulsified in an aqueous based medium; and
5 a hydrophilic polymer, said hydrophilic polymer associated with the supporting polymer,
said composition characterized in that, when crosslinked at the functional moieties, the supporting polymer forms a three-dimensional network which minimizes disassociation of the hydrophilic polymer and maintains the slip of the
10 composition.
2. The coating composition of claim 1, wherein the functional moiety is selected from the group consisting of amino, hydroxyl, amido, carboxylic acid and derivatives thereof, sulphydryl (SH), unsaturated carbon bond and heteroatom bonds,
15 N-COOH, N(C=O)HS(OR), alkyd/dry resins, formaldehyde condensates, methyol acrylamides and allylic groups.
3. The coating composition of claim 3, wherein the supporting polymer is selected from the group consisting of polyacrylates, polymethacrylates, polyurethanes, polyethylene and polypropylene co-difunctional polymers, polyvinyl chlorides, epoxides, polyamides, polyesters and alkyd copolymers.
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4. The coating composition of claim 1, wherein the hydrophilic polymer is selected from the group consisting of poly(N-vinyl lactams, poly(vinylpyrrolidone),
25 poly(ethylene oxide) poly(propylene oxide) polyacrylamides, cellulosics, methyl cellulose, polyanhydrides, polyacrylic acids, polyvinyl alcohols, and polyvinyl ethers.
5. The coating composition of claim 1, wherein the supporting polymer
has a molecular weight in the range of 5,000 to 10,000,000.
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112 6. The coating composition of claim 1, wherein the supporting polymer has a molecular weight in the range of 30,000 to 100,000.

125 7. The coating composition of claim 1, wherein the functional moiety of the supporting polymer has an equivalent weight in the range of about 115 to about 8700,

10 8. The coating composition of claim 7, wherein the supporting polymer comprises polyacrylate and the equivalent weight of the functional moiety is in the range of about 200 to about 1000.

15 9. The coating composition of claim 7, wherein the supporting polymer comprises polyurethane and the equivalent weight of the functional moiety is in the range of about 1000 to about 8700.

11 10. The coating composition of claim 7, wherein the supporting polymer comprises polyamine epoxide and the equivalent weight of the functional moiety is in the range of about 100 to about 2000.

20 11. The coating composition of claim 1, further comprising:
11 a crosslink agent.

12 13. The coating composition of claim 12, wherein the crosslink agent is selected from the group consisting of aziridines, polyfunctional carbodiimides, 25 polyfunctional epoxides, unsaturated carbon and heteroatom bonds, melamine/urea condensates and ionic agents.

13 14. The coating composition of claim 1, further comprising:
one or more additives selected from the group consisting of co-solvents, 30 plasticizers, antifoaming agents, anticrater agents, coalescing solvents, bioactive agents,

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antimicrobial agents, antithrombogenic agents, antibiotics, pigments, paint additives, radiopacifiers and ion conductors

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15. A coated article, comprising:
5 an article having a surface coated with a hydrophilic coating, said hydrophilic coating comprising:
a three-dimension supporting polymer matrix, said supporting polymer forming a three-dimensional network through crosslinking bridges; and
a hydrophilic polymer, said hydrophilic polymer associated with the
10 supporting polymer,
said coating characterized in that the supporting polymer forms a three-dimensional network which, when wet, minimizes disassociation of the hydrophilic polymer and retains slip for up to 24 hours in ambient aqueous medium.
- 15 16. The coated article of claim 15, wherein the supporting polymer is selected from the group consisting of polyacrylates, polymethacrylates, polyurethanes, polyethylene and polypropylene copolymers, polyvinyl chlorides, epoxides, polyamides, polyesters and alkyd copolymers.
- 16 17. The coated article of claim 15, wherein the hydrophilic polymer is selected from the group consisting of poly(N-vinyl lactams, poly(vinylpyrrolidone), poly(ethylene oxide) poly(propylene oxide) polyacrylamides, cellulosics, methyl cellulose, polyacrylic acids, polyvinyl alcohols, and polyvinyl ethers.
- 18 18. The coated article of claim 15, wherein the crosslink density is in the range of 100-10,000 g/equivalent crosslink.
- 18 19. The coated article of claim 15, wherein the crosslinking bridges are selected from the group consisting of moieties of aziridines, carbodiimides, epoxides, unsaturated carbon and heteroatom bonds, ionic agents and melamine/urea

condensates.

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20. The coated article of claim ~~15~~, wherein the surface is selected from the group consisting of ocular devices, lenses, medical devices, membranes, recreational products, such as boat hulls, open celled foams, closed celled foams and water-contacting items.

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21. A method of preparing an article having a hydrophilic coating, comprising:

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15 applying a coating composition onto a surface of an article, said coating composition comprising a supporting polymer, said supporting polymer comprising a plurality of functional moieties capable of undergoing crosslinking reactions, said supporting polymer soluble in or emulsified in an aqueous based solution; and a hydrophilic polymer, said hydrophilic polymer interacting and associated with the supporting polymer; and

crosslinking the supporting polymer at said functional moieties so as to form a three-dimensional network which substantially eliminates disassociation of the hydrophilic polymer.

20 22. The method of claim ~~21~~, further comprising:
pretreating the article surface prior to coating.

22 23. The method of claim ~~22~~, wherein the pretreatment is selected from the group consisting of chemical etching, corona and plasma etching, priming with other chemicals, coatings and adhesives and mechanical abrasion.

23 24. The method of claim ~~21~~, further comprising:
drying the coated surface to provide a dry coating thereon.

24 25. The method of claim ~~21~~, wherein the step of crosslinking is

accomplished by initiating a self-crosslinking reaction of the functional moieties of the supporting polymer.

~~26.~~ 26. The method of claim ~~21~~, wherein crosslinking is accomplished by addition of a crosslinking agent.

~~27.~~ 27. The method of claim ~~26~~, wherein the crosslink agent is selected from the group consisting of aziridines, polyfunctional carbodiimides, polyfunctional epoxides, unsaturated carbon and heteroatom bonds, ionic agents and melamine/urea condensates.

~~28.~~ 28. The method of claim ~~21~~, wherein the step of coating is accomplished by a technique selected from the group consisting of dip coating, roll coating and spray coating.

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